No. 8200055

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

COMMON WHEAT

'2553'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 15th *day of* July *in the year of our Lord one thousand nine hundred and* eighty-two.

Attest:
Kenneth A. Evans
Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R Block
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
W3017A	2553	PV NUMBER 8200055
2. KIND NAME: Wheat	3. GENUS AND SPECIES NAME: *Triticum aestivum*	FILING DATE 1/18/82 / TIME 3:00 A.M. P.M.
4. FAMILY NAME (BOTANICAL): gramineae	5. DATE OF DETERMINATION: September 1, 1978	FEE RECEIVED $ 500.00 $ 250.00 / DATE 1/18/82 6/2/82

6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*	8. TELEPHONE AREA CODE AND NUMBER
Pioneer Hi-Bred Int'l., Inc. Plant Breeding Division Dept. of Cereal Seed Breeding	Rt. 2 Hutchinson, Kansas 67501	(316) 662-5439

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Iowa May, 1926	May, 1926

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:
Dr. Charles Hayward
Pioneer Hi-Bred International, Inc.
Rt. 2
Hutchinson, Kansas 67501

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[ ] YES [ ] NO	[ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. ~~DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [ ] YES [ ] NO~~

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

November 25, 1981
(DATE)

Charles F. Hayward
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

13A. Exhibit A. Origin and Breeding History of 2553 Wheat

Pioneer variety '2553', *Triticum aestivum* L., em Thell., a soft red winter wheat, was developed by Pioneer Hi-Bred International, Inc., from the cross 'Coker 68-16'/3/'Kawvale'/'Vigo'//'Directour Journoc'. A selection from the Kawvale/Vigo cross was crossed to Directour Journoc. The final cross was made in the spring of 1969. The pedigree of Coker 68-16 is Purdue 4946A4-18-2-10-1 x 'Hadden'.

The F_1 generation was grown in the field at Hutchinson, Kansas in 1969-70. In 1970-71, F_2 seed was space planted and 110 single plants selected (for height, maturity, straw strength and agronomic type). The selected plants were grown in increase rows at Hutchinson, Kansas and Carrollton, Missouri in 1971-72. In 1972, one of 15 increase rows selected (for winterhardiness, height, maturity, straw strength, disease resistance and for plant and head type) was designated as W3017 and entered into preliminary yield trials in 1973-74. A reselection, designated as W3017A and tracing to a single F_5 plant, was made in 1975. W3017A has been tested in yield trials and for milling and baking quality since 1976-77. Breeder's seed of W3017A was derived from an F_9 bulk rogued for purity in 1978-79. Following the 1980-81 harvest, W3017A was designated to be sold as Pioneer Variety 2553.

2553 has shown uniformity and stability for all traits as described in Exhibit C (Form LPGS-470-6) -- "Objective Description of Variety."

Variants of 2553 that can be expected are: awnless plants (< 1/30,000) and under certain environmental conditions (< 1/30,000) plants have darker green color with purple auricles.

13B. Exhibit B. Novelty Statement

2553 is most similar to the soft red winter variety S76 but uniquely different in a number of characteristics.

2553 can be distinguished from S76 by the following: Plant height of 2553 averages about 3 cm shorter. The H3 gene for Hessian fly resistance is present in S76 but absent in 2553. Phenol reaction for 2553 is light brown to brown, similar to the variety 'Seneca', while the phenol reaction for S76 is dark brown to black, similar to the variety 'Monon'. Shoulder of the glume is oblique in 2553 and wanting in S76. 2553 has a higher test weight and 1000 kernel weight than S76, averaging 1.2 pounds/bushel and 10 gm/1000 kernel more respectively. 2553 is higher yielding with better straw strength than S76 (Table 1). S76 is more winterhardy than 2553.

FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Pioneer Hi-Bred International, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
Plant Breeding Division
Department of Cereal Seed Breeding
Rt. 2
Hutchinson, Kansas 67501

FOR OFFICIAL USE ONLY
PVPO NUMBER 8200055
VARIETY NAME OR TEMPORARY DESIGNATION 2553

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[2] 1 = SPRING 2 = WINTER 3 = OTHER *(Specify)* _____
[1] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____
[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][2][9] FIRST FLOWERING
[2][3][6] LAST FLOWERING

4. MATURITY *(50% Flowering)*:
[ ][ ] NO. OF DAYS *EARLIER* THAN .....
[0][2] NO. OF DAYS *LATER* THAN .....
[ ] [1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT *(From soil level to top of head)*:
[0][9][6] CM. HIGH
[ ][ ] CM. TALLER THAN .....
[0][3] CM. SHORTER THAN .....
[ ] [1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING *(See reverse)*:
[3] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[0][4] NO. OF NODES *(Originating from node above ground)*
[2] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[2][4] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____
[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH *(First leaf below flag leaf)*
[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[2][3] CM. LEAF LENGTH *(First leaf below flag leaf)*:

FORM LPGS-470-6 (3-79) (Formerly Form GR-470-6 (2-73), which may be used)

8200055

11. HEAD:

[1] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[0][8] CM. LENGTH

[1][2] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[2] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[2] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[3] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK (Light brown to brown, similar to 'Seneca')

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[0][7] MM. LENGTH

[0][3] MM. WIDTH

[4][2] GM. PER 1000 SEEDS

RECEIVED
JAN 18 1982
U.S. DEPARTMENT
AMS, LPG&S DIV
PVPO

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] STEM RUST (Races) _____

[0] LEAF RUST (Races) _____

[0] STRIPE RUST (Races) _____

[1] LOOSE SMUT

[1] POWDERY MILDEW

[0] BUNT

[2] OTHER (Specify) Soil Borne Mosaic Virus and Spindle Streak Mosaic Virus

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[2] APHID (Bydv.)

[0] GREEN BUG

[0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____

HESSIAN FLY RACES: [0] GP [1] A [1] B [1] C [1] D [0] E [1] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Pioneer Variety S76	Seed size	McNair 1003
Leaf size	Pioneer Variety S76	Seed shape	Pioneer Variety S76
Leaf color	Abe	Coleoptile elongation	Abe
Leaf carriage	Pioneer Variety S76	Seedling pigmentation	Pioneer Variety S76

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

13D. Exhibit D. Additional Description of the Variety

'2553' is a common soft red winter wheat, *Triticum aestivum* L.

Flowering date of 2553 is 2 days later than the variety Arthur and 1 day earlier than Pioneer variety S76. At Tipton, Indiana, when seeded about October 1, average first flowering is May 27 or about 229 days after emergence. Last flowering averages about 7 days later. It is recognized that environmental factors influence flowering of varieties differently.

2553 has averaged 96 cm in height, about 3 cm shorter than Arthur and Pioneer variety S76.

The plant color of 2553 at booting stage is light blue-green while Arthur is green and Beau is dark green. Anther color of 2553 is yellow, similar to Pioneer variety S76.

Anthocyanin has been absent in the stem of 2553. A moderate waxy bloom occurs on the stem. Internodes of 2553 are hollow and the internode length between the flag leaf and leaf below is about 24 cm. Normally 4 stem nodes are present above ground. At maturity, stems are yellow and exceptionally strong. The last internode of the rachis is free of hairiness.

Auricles of 2553 are lacking in anthocyanin and free of hairiness.

The flag leaf is generally recurved at booting and not twisted. Hairs are absent from the first leaf sheath. A moderate waxy bloom occurs on the flag leaf sheath. The first leaf below the flag leaf averages about 12 mm wide and 23 cm long.

Spikes are generally mid-dense to lax, tapering, awned, yellow and generally nodding at maturity. Awns are rough and about 5-6 cm in length. Spike width and length averages about 12 mm and 8 cm, respectively. However, spike width and length are variable with plant population and level of production.

The glumes of 2553 are long and wide, glabrous and generally the shoulders are oblique. Beaks are acuminate.

Coleoptile color is white and seedling anthocyanin is absent. Juvenile plant growth habit is semi-erect.

Kernels are red in color, ovate in shape, with rounded cheeks and a shallow crease. The brush is not collared and medium in size. The embryo is ~~large~~ medium Ai 820414 in size. Kernels average 7 mm long and 3 mm wide and weigh about 42 g per 1000. Phenol reaction is light brown to brown, similar to the variety Seneca.

13D. Exhibit D. cont.

2553 is MR-MS to leaf rust (*Puccinia recondita* f. sp. *tritici*) and susceptible to stem rust (*P. graminis* f. sp. *tritici*) races currently common in the soft red winter wheat region. 2553 has not been tested to specific races of leaf and stem rust nor has it been tested for stripe rust (*P. striiformis*), bunt (*Tilletia foetida* and *T. caries*) and loose smut (*Ustilago tritici*). It is susceptible to powdery mildew (*Erysiphe graminis* f. sp. *tritici*).

2553 has a good level of resistance to soil borne mosaic virus, spindle streak mosaic virus and barley yellow dwarf virus. In testing for BYDV, Clintland 64 oat variety was used as a very susceptible check, Abe as the susceptible wheat variety check and Hart as a wheat variety check with notable resistance. Results were as follows: Clintland 64 - 6; Abe - 5; Hart - 3; 2553 - 3.

2553 is susceptible to races A, B, C, D and F of Hessian fly and has not been tested for races GP, E and G. Hessian fly and BYDV tests were conducted by the Small Grains Insect Control Group, USDA-ARS, Department of Entomology, Purdue University, Lafayette, Indiana. 2553 has not been tested for sawfly, greenbug and cereal leaf beetle.

Table 1

Performance of Pioneer Varieties 2550 and 2553 and Standard Varieties Grown in Elite Yield Trials (1978-81)*

Variety	Yield bu./acre (72)***	Test Weight lbs./bu. (51)	Height cm (48)	Days to Flowering After 4/1 (39)	Lodging** Score (45)	Powdery** Mildew (13)	Leaf** Rust (9)	Spindle Streak** Mosaic Virus (3)	Soil Borne** Mosaic Virus (4)
2550	71.4	57.6	95	55.4	6.5	6.1	8.0	7.0	6.2
2553	68.0	59.0	96	55.7	8.2	3.8	6.8	8.0	7.0
S76	63.4	57.8	99	56.4	7.5	4.1	6.4	8.3	7.5
S78	62.6	57.5	93	57.2	6.8	3.5	7.3	8.7	5.8
Hart	62.4	57.8	103	55.1	6.7	4.1	5.7	7.7	7.0
Abe	60.2	58.7	99	54.3	4.7	6.2	4.5	4.7	4.2
Beau	59.9	59.4	99	54.8	6.2	6.6	4.9	5.0	4.0
Sullivan	58.1	59.2	103	53.6	4.5	6.2	5.5	4.0	5.8

*Data collected at the following locations for the years specified: Loogootee, IL; Ft. Branch and Tipton, IN (Normal planting) - 1978-81; St. Joseph, IL - 1979-81; Tiffin, OH - 1979; Perry, MI - 1980; Tipton, IN (Late planting) - 1980-81.

**Scale 1-9 where 9 = excellent or resistant and 1 = poor or 100% susceptible.

***Number in parenthesis = replications.

Soil Borne Mosaic Virus data collected at University of Illinois SBMV Nursery in 1979-80.

820055

Table 2

Results of Quality Testing on 2553
(Pioneer Wheat Quality Lab)

Year/Sample	Flour Yield (%)	Break Flour (%)	Flour Protein (%)	AWRC (%)	Cookie Diam. (cm.)	PSI (%)
Avg. '77 Data (2 loc.)						
2553	65.9	38.0	11.3	55.5	17.5	49.3
Abe	68.6	38.5	11.1	51.9	17.9	54.3
Avg. '78 Data (3 loc.)						
2553	65.5	37.8	7.7	54.6	19.6	55.2
Abe	68.2	35.4	8.3	51.4	19.2	51.1
Avg. all checks	65.6	35.3	8.7	53.9	19.3	48.8
Avg. '79 Data (3 loc.)						
2553	64.8	35.4	7.7	54.7	19.8	50.9
Abe	66.4	33.6	8.1	54.9	19.7	46.3
Avg. all checks	65.4	33.5	8.3	54.8	19.6	45.5
Avg. '80 Data (3 loc.)						
2553	71.1	40.6	10.2	55.5	18.8	33.3
Abe	71.0	37.9	10.5	52.4	18.8	32.9
Avg. all checks	70.1	38.4	10.8	53.7	18.7	31.9

NOTES: Locations tested include: Loogootee, Illinois; Fort Branch and Tipton, Indiana; and Tiffin, Ohio

Check samples include various combinations of: Abe, Beau, Coker 68-15, Double Crop, Funk W504, Hart, McNair 3001, Roland, Ruler, Sullivan and Titan

Methods: Milling - Brabender Quadramat Sr. Mill
Protein - Udy method
AWRC - Micro method on milled flour
Cookie diameter - Total diameter of two cookies
PSI - Through '79 - Sonic sifter
- From '80 on - A B grinder, sieve shaker